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THE EFFECT OF TERRAMYCIN AND STILBESTROL ON GROWING AND FATTENING STEERS*

R. M. Richard, C. B. Roubicek, and E. B. Stanley

This experiment was designed to determine the effect of feeding the antibiotic, terramycin, and the synthetic sex-like hormone, stilbestrol, to growing and fattening steers under Arizona feeding conditions.

Experimental Procedure:

Sixty-eight steer calves were divided equally into four groups on the basis of weight. A pre-test period of 21 days was used to condition the steers to experimental feeding. The same basal ration was fed to all steer groups during the entire adjustment and experimental periods. As shown in table 1, the basal ration consisted of hegari silage, chopped alfalfa hay, rolled milo grain, and cottonseed meal. In addition to basal ingredients, the following additives were fed:

Lot 1. None
Lot 2. Terramycin - 10 milligrams per 100 lbs. live steer weight, daily.
Lot 3. Stilbestrol - 10 milligrams per steer daily.
Lot 4. Terramycin + Stilbestrol - levels same as lots 2 and 3.

The additives were thoroughly mixed with cottonseed meal prior to feeding. Since cottonseed meal served as the carrying agent, it was fed at a constant level. The remainder of the ration was mixed before feeding and fed in amounts which the steers would consume. Water and granular salt were provided free-choice.

Discussion of Results:

The results of the 168-day test period are summarized in tables 1 and 2.

Feedlot gains show that steers receiving stilbestrol (lot 3) gained an average of .08 pounds per day more than steers fed the control ration (lot 1). The differenc in rate of gain was not statistically significant. When terramycin was fed in combination with stilbestrol (lot 4), gains were significantly higher than those obtained with the other three rations. A synergistic effect seemed to result from the feeding of the hormone and the antibiotic in combination in that gains were faster than when either was fed alone. When the entire feeding period is considered, no stimulation in rate of gain resulted from the feeding of terramycin alone (lot 2). In fact, average daily gain for the 168-day period was less for steers fed terramycin than for those receiving the control ration. A fact worthy of note is that the lower average gain of the antibiotic fed steers was due to a relatively poor response during the last month of the feeding trial. Steers fed the antibiotic alone gained an average of only 1.15 pounds during the last 28-day period of the test and showed a decline in feed consumption. A similar response did not occur when the same level of terramycin was fed with stilbestrol. Further work is needed to determine whether the adverse result in lot 2 may be attributed to the antibiotic.

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* The steers used in the experiment were purchased through the cooperation of the Arizona Hereford Association.

TABLE 1. The Effect of Strilbestrol and Terramycin on Growing and Fattening Steers

Lot No.	1	2	3	4
Additive to basal ration (1)	None	Terramycin	Stilbestrol	Stilbestrol + Terramycin
No. Steers	17	17	17	17
No. days fed	168	168	168	168
Ave. wt. change in feedlot, lbs.				
Ave. initial wt.	484.7	483.2	484.7	488.2
Ave. final wt.	837.7	818.6	850.4	892.8
Ave. daily gain	2.10	2.00	2.18	2.41
Ave. daily feed consumed, lbs.				
Hegari silage	19.92	20.00	19.94	21.49
Alfalfa hay, chopped	2.78	2.78	2.79	3.02
Milo grain, rolled	7.90	7.94	7.91	8.57
Cottonseed meal	1.44	1.44	1.44	1.44
Total	32.04	32.16	32.08	34.52
Feed per 100 lbs. gain in feedlot, lbs.				
Hegari silage	948.57	1001.96	916.32	892.28
Alfalfa hay, chopped	132.38	139.36	128.06	125.32
Milo grain, rolled	376.19	397.52	363.33	355.78
Cottonseed meal	68.57	72.19	66.01	59.80
Total	1525.71	1611.03	1473.72	1433.18
Feed cost per 100 lbs. gain in feedlot (2)	$ 19.31	$ 20.72	$ 18.93	$ 18.61

(1) The stilbestrol and terramycin used in this experiment were generously supplied by Chas. Pfizer & Company, Inc., Terre Haute, Indiana.

(2) Feed prices used: Hegari silage, $10/T; alfalfa hay, $30/T; milo grain, $56/T; cottonseed meal, $60/T; stilbestrol, $0,59/1000 milligrams;terramycin, $0.099/1000 milligrams. In calculating feed costs, the cost of additives is included.

TABLE 2. The Effect of Stilbestrol and Terramycin on Growing and Fattening Steers

Lot No.	1	2	3	4
Additive to basal ration	None	Terramycin	Stilbestrol	Stilbestrol + Terramycin
Shrink,%				
Overnight	1.34	0.87	1.25	1.11
In transit	4.95	0.18	4.03	2.93
Total shrink	6.22	1.05	5.23	4.01
Ave.wt. change based on off-truck wt.,lb.				
Ave. initial wt. into feedlot (minus 4% shrink)	465.3	463.9	465.3	468.7
Ave. final wt. off truck at Phoenix	785.6	810.0	805.9	856.1
Ave. daily gain	1.91	2.06	2.03	2.31
Feed cost per 100 lbs. gain (1)	$ 21.29	$ 20.08	$ 20.32	$ 19.39
Slaughter data				
Ave. carcass wt. (hot wt. minus 4% shrink)	471.2	471.8	482.0	504.1
Ave. yield, 9%	59.98	58.24	59.81	58.82
Ave. carcass grade (2)	1.52	1.47	1.63	1.62
Ave. live value per cwt. (3)	$ 19.35	$ 18.87	$ 19.34	$ 18.87

(1) Feed prices used: Hegari silage, $10/T; alfalfa hay, $30/T; milo grain, $56/T; cottonseed meal, $60/T; stilbestrol, $0.59/1000 milligrams; terramycin, $0.099/1000 milligrams. In calculating feed costs, the cost of additives is included.

(2) Carcass grade factors: Top choice, 1.0; medium choice, 1.4; low choice, 1.7; top good, 2.0; medium good, 2.4; and low good, 2.7.

(3) Determined by grade and yield based on the following prices; Choice, $32.50; Good, $31.00. Price for grade times yield provides live value per cwt.

Average feed consumption was approximately the same when either stilbestrol or terramycin was fed separately or when the ration contained no additive. Feed consumption was highest when terramycin and stilbestrol were fed in combination. With the exception of the last 28-day period, steers receiving terramycin consumed more feed than steers receiving stilbestrol or the control ration. Prior to that time, antibiotic feeding seemed to result in higher and more constant consumption of feed, particularly during periods of inclement weather and sudden, marked temperature changes.

The efficiency of feed lot gains was improved by the feeding of stilbestrol alone or with terramycin. Steers fed stilbestrol required less feed per unit of gain than steers fed the control ration. Steers fed the combination of terramycin and stilbestrol were most efficient in the feed lot. In this experiment terramycin appeared to adversely affect feed efficiency when fed alone.

At the conclusion of the feeding trial, the steers were weighed on two consecutive days to determine final feed lot weights. The steers were marketed the day following the final weighing. Data were obtained on shrinkage, carcass grade, and yield. These data are presented in table 2. In determining shrinkage, cattle were weighed and held off feed and water for about 12 hours. Then they were weighed, immediately loaded on trucks, trucked about 125 miles and weighed off the truck. Significant were the relatively high shrink of steers fed the control ration and the comparatively light shrink of steers fed terramycin. Steers fed stilbestrol showed a greater shrink than those fed the combination of stilbestrol and terramycin.

Average daily gains based on off truck weights are presented in table 2. Initial weight is weight at the beginning of the feeding trial minus four per cent shrink. Final weight is weight obtained immediately after the finished cattle were unloaded at the Cudahy Packing Company plant in Phoenix. A 12-hour stand without feed or water and the 125 mile haul from Tucson to Phoenix preceded the final weighing.

Because of difference in shrink between lots, comparisons based on off-truck weights differ from those based on final feed lot weights. When total shrink was considered, there was no appreciable difference between gains of steers fed terramycin and those fed stilbestrol (2.06 vs. 2.03 lbs. per day). Steers fed the control ration showed the highest shrink and the lowest rate of gain, 1.91 pounds. Gains were significantly greater, 2.31 pounds, when the hormone and antibiotic were fed in combination. Steers fed the combination gained 21% faster than those fed the control ration. The response from feeding the two additives in combination was greater than the combined response from feeding the additives separately.

Of concern to the feeder is the possibility that the feeding of stilbestrol will result in certain objectionable side reactions. Previous experiments have shown that the implantation of pellets of stilbestrol beneath the skin of growing and fattening cattle frequently produced undesirable side effects such as high tail heads, depressed loins, heavy shoulders, and excessive mammary development. In this experiment, no undesirable side effects from stilbestrol feeding were observed. In appraising the live cattle at the time of marketing, packer buyers did not distinguish between steers fed stilbestrol and those that had not received the hormone.

Carcasses from steers fed stilbestrol tended to grade slightly lower on the average. This was due primarily to less internal fat, indicating less marbling. However, differences in grade between lots were so slight as to be of doubtful economic significance.

Steers which received terramycin separately and those which received terramycin and stilbestrol in combination tended to dress out less than control steers. There was no appreciable difference in average yield between control steers and those fed stilbestrol separately.

Cattle are sometimes marketed on a grade and yield basis. Average values per 100 pounds live weight based on grade and yield were highest in the case of steers fed the control ration and those fed stilbestrol separately, primarily because of a higher average yield.